Abstract

While there have been many studies on instructional and on-task side of computer supported collaborative learning (CSCL), social and non-task side of the CSCL has received less attention. This paper observes and studies the pattern of non-task social messaging over a period of time in online Seminar rooms –designed for learning activities- as well as Coffee shops- designed for informal conversations. The objective is to firstly uncover the pattern of social interactions in the online collaborative learning environment and, secondly to understand how the level of social interactions changes over time and what factors facilitate and lead such changes. Transcript Analysis Tool (TAT) has been used to code discussions of three online classes during a 10-week postgraduate summer course in an Australian university. Findings have indicated existence of a substantial amount of non-task interactions among students. Furthermore, the results have shown a larger amount of non-task interactions occurred at the beginning and end of the semester as well as during some special occasions. Students’ willingness to share personal and work-related experiences with other classmates is amongst top factors leading such trend in social interactions in the environment.

1. Introduction

Computer supported collaborative learning (CSCL) incorporates collaborative learning activities and communications between participants and among groups via networked computers, where interactions can be synchronous or asynchronous [14]. Collaboration is the heart of CSCL and facilitators and developers are continuously looking for ways to improve the level of effective participation of the people in CSCL environments.

The anywhere-anytime characteristic of the CSCL, plus its support of interactive group learning made educators believe that CSCL is the next generation of teaching and learning environment [8]. Yet, current research shows that despite variety of benefits provided by virtual learning environments, learners’ isolation and lack of sociability of the virtual space are emerging as key pitfalls for effectiveness of those environments and deserve more thoughts and explorations in future systems development activities [11].

While technologically the CSCL has been considerably improved, studies show that social dimension of CSCL is often neglected or is assumed to happen automatically simply by creating such virtual learning environments [9]. However it was noted that by simply putting students in a computer mediated environment with several technological features does not necessarily lead to productive collaboration and social interactions [6,9]. Rather, more investigation is needed to analyze individuals’ online activities in order to discover patterns and categories of students’ social interactions.

In another study, sociability of CSCL has been considered the key issue in both facilitating individual’s participation as well as enhancing performance of collaborative learning in online environments [9]. They then talked about current pitfalls of CSCL effectiveness from sociological point of view and argued that neglecting social dimension of the environment is one of the current pitfalls of the CSCL effectiveness. Stodel et al.  investigated missing themes in student’s perception in online learning environments in comparison with face-to-face learning [16]. They found that one of the missing themes is that students are interested to have better opportunity to know one another. It was also reported that student’s perceived online learning experience is very task oriented and they don’t have enough opportunities for socializing with others.

Students’ social interactions in CSCL environments can be broadly categorized as on-task and non-task interactions [10]. While the former includes instructional and learning activities- such as group learning and group processing, the latter comprises non-pedagogical activities which are not direct learning interactions- e.g., greetings, social support and friend making. In their content analysis of online messages, [2] report that other than on-task messages,
students exchange a remarkable number of non-task and non-pedagogical messages. While the above studies do not propose a structure for the non-task messages, they report that greetings, chit chatting and self-exposure are among most frequent non-task contents.

Research has indicated that such interactions in the CSCL environment lead to and facilitates more effective participation and learning outcomes [13]. In another study it was reported that social connections are a means of accomplishing primary course objectives and course facilitators were recommended to encourage such interactions in the online collaborative classes [12].

Because CSCL is predominantly text-based [1], the content of online messages represents a rich source of individual’s interactions and behaviors. The current study emphasizes on non-task aspect of interactions in the CSCL environments and it employs a previously specified and tested taxonomy to study content of online messaging in the environment over a period of time with two objectives: (1) to demonstrate the pattern of non-task social interactions in a CSCL environment, (2) to study changes of the level of social interactions over time and to show factors that can facilitate and lead such changes.

2. Method

Content analysis is becoming a popular methodology for CSCL research as the permanent nature of asynchronous text-based messaging provides a rich source to study online interactions [5]. The key success factor in content analysis for achieving reliable results is presence of an appropriate model or coding schema. The model should not be too complex to use, and it must be parsimonious with discrete categories to effectively analyze the content. In a review of content analysis schemes in online asynchronous discussion groups, it was suggested that when analyzing content of online messages, use of previously tested coding schemes and models are more proffered than developing a new instrument or model [20]. This is because applying an existing scheme fosters reliability and validity of the scheme as well as possibility to add contributions to improve the scheme. Therefore, in this section, existing instruments and coding schemes that address social interactions in CSCL are reviewed and then one scheme is selected for the purpose of this paper.

Henri’s model is a popular instruments used by CSCL researchers [7]. Her model consists of five elements. These are Participative, Social, Interactive, Cognitive, and Metacognitive elements. The Social element includes all contents that are not related to the formal discussion. While this model addresses non-task social contents, there is no formal recognition of possible subcategories of this element. Another study has analyzed messages of four CSCL classes in order to examine the process of knowledge construction by students [17]. This study uses a self-developed category of online messages. This category consists of two subcategories: task-related messages and non-task related messages. Task related messages include New Ideas, Explanations, and Evaluation. Non-task related messages include Planned, Technical, Social, and Nonsense discussions. One pitfall of the above proposed category is that it does not examine reliability of the category. Moreover, definitions of the subcategories are not provided. To distinguish a subcategory from others, the authors have just offered one example. Therefore it is not clear that what sort of messages should be considered in which subcategory.

Another study has assessed social presence in asynchronous text-based computer conferencing and proposed a template for assessing conference transcripts in learning environments [15]. This template includes three categories of communicative responses that contribute to the social presence. The first category is Affective which is represented by three indicators: Expression of emotions, Use of humor, and Self-disclosure. The second category is Interactive, represented by six indicators: Continuing a thread, Quoting from other’s message, Referring explicitly to other’s message, Asking questions, Complementing, and Expressing agreement. And the third category is Cohesive, represented by three indicators: Vocatives, Addresses or refers to the group using inclusive pronouns, and Phatics/Salutations. The authors have provided examples for each category and indicators and also have assessed inter-reliability of the template. Yet, they have not distinguished which indicators reflect non-task or on-task communicative responses. Weinberger and Fischer proposed a multi-dimensional framework to analyze argumentative knowledge construction in CSCL [19]. Through sampling and segmentation of the discourse, they came up with four process dimensions: participation, epistemic, argumentative, and social mode. The epistemic dimension addresses how individuals work on knowledge construction task in the collaborative learning environment. This dimension differentiates whether individuals are engaging in learning and on-task activities (e.g. solving problems) or they are concerned with non-task activities. The authors then recognized five categories for epistemic dimension as: Construction of problem space, Construction of conceptual space, Construction of adequate relations between conceptual and problem space, Construction
of inadequate relations between conceptual and problem space, and Construction of relations between prior knowledge and problem space. This study also does not recognize categories of non-task epistemic dimension and just mentions that any off-topic discussions would be identified as non-epistemic activities.

TAT (Transcript Analysis Tool) has been developed for transcript analysis to analyze interaction patterns in online distance educations [3]. This tool is composed of eight categories of messages and distinguishes on-task and non-task social activities. In further development of the TAT, subcategories of non-task social support have been defined and deployed [4]. For the purpose of this study, TAT is selected as it defines subcategories of non-task social interactions in CSCL environments. Moreover, the tool also offers quantitative measures to represent the level of non-task social interactions against other type of interactions in the environment.

2.1 The TAT taxonomy

The TAT instrument differentiates various groups of messages. To make such differentiation obvious the TAT instrument uses sentences as the unit of analysis. The initial version of TAT introduced five primary categories along with six secondary categories, as following:

1B – Horizontal questions: invite negotiation on a plausible answer

2A – Non-referential statements: make no reference to others’ comments or views

2B – Referential statements: make direct or indirect reference to others’ statements

3 – Reflections: usually guarded personal thoughts, judgments, opinions or experiences

4 – Scaffolding and engaging: intended to initiate, continue, encourage or acknowledge interaction, and to “warm” or personalize the interaction environment

5A – Quotations and paraphrases: from sources within or outside the conference

5B – Citations: attributions of quoted or paraphrased material

While scaffolding was recognized for non-task interactions such as greetings, thanks, and comments without real substantive meaning, secondary categories were not identified. In a more recent study, TAT was expanded and scaffolding interactions were further elaborated into 11 supportive behaviors [4]. Supportive behaviors are those online interactions that contain ‘supportive’ elements and reflect non-task exchanges. Supportive elements are important, as they motivate individuals to better engage in online learning activities. Therefore a total of 13 supportive behaviors have been identified which reflect non-task interactions [4].

1. Type 1B: Horizontal questions

2. Type 2B: Referential statements

Type 4: Scaffolding and engaging comments:

3. Acknowledgements

4. Agreements

5. Apologies

6. Closings

7. Emoticons

8. Humor

9. Invitations

10. Rhetorical questions

11. Salutations

12. Signatures

13. Thanks

For the purpose of this paper, the above 13 supportive behaviors are employed to determine the pattern of individuals’ non-task social interactions. Moreover, in this paper the TAT’s Type 3, Reflections, is considered as a supportive behavior. The reason is that this category includes personal thoughts, experience and judgments, which are non-task social interactions and suit the objective of our paper.

To quantitatively measure the amount of non-task exchanges, the TAT taxonomy uses a support ratio. Support ratio is the support score divided by the total number of messages. Support score is calculated as the sum of all sentences coded in TAT’s Type 1B (Horizontal questions), 2B (Referential statements), 3 (Scaffolding and engaging comments) and 4 (Reflections).

2.2. The environment under study

The environment under study was a summer semester of a master degree in an Australian university with all courses offered purely online. The courses were run for 10 weeks, from 20th of November 2007 to 31st of January 2008. During the summer semester, 200 students were enrolled and 10 courses were offered. Each course was administered by a facilitator. All communications in this online space were text based and were administered by a CSCL software program. Three classes were randomly selected. Each class had 20 students and content of exchanged messages was copied in a separate database. Due to ethical considerations, individual’s personal information was then removed from the data and the rest were considered for the analysis. In this collaborative learning environment, almost all students were full-time employed and part-time student. Of the whole population of the summer course, about 65% were male and 35% were female. Their age and work
experience ranges from 27 to 54 and 8 to 30 years, respectively. The distinctive characteristic of the CSCL classrooms selected for this study is the availability of online Coffee shop. Discussions happened in two different online rooms: Coffee shop and Seminar room. While course materials and course related discussions were facilitated in the Seminar room, Coffee shop was designed for non-task purposes and interactions.

3. Data collection

Data was collected from three on-line classes, which were selected randomly from ten available classes. Each class had an enrolment of 20 students. The content of the Seminar Room and Coffee Shop for each class was copied to a separate database. To comply with ethics approval requirements personal information was then removed from the data by an independent research assistant, and then forwarded to the researchers for the analysis.

The content of the Seminar rooms and Coffee shops were stored in two separate folders, where each folder had three sub-folders for each of the three classes. Furthermore, discussions occurred in each class were grouped in ten categories for ten weeks. NVivo was used to partially automate analysis of discussions. The software was also carried out to highlight segments of the text with coding that would represent a specific non-task behavior. Fifteen nodes were created in NVivo for the fifteen non-task behaviors and the highlighter segments were assigned to the corresponding node. Then, the number of elements in each node for each week was counted and considered for further analysis.

To examine interrater reliability of the analysis, a full instruction about TAT was given to a recent PhD graduate who previously was not involved in the present study. This person was asked to randomly select twenty percent of total messages and to code it based on instructions provided. Results showed a Cohen’s kappa of 0.81, which fell into the accepted level [3].

4. Results

The results of the content analysis have been demonstrated in two sections, where each section addresses one of the research objectives. Firstly, the results show the pattern of non-task interactions, and secondly, the trend of these interactions has been separately shown over a period of time.

![Figure 1: Pattern of non-task social messages in both Coffee shops and Seminar rooms in the three classes](image-url)
4.1 Existence of non-task interactions

Figure 1 portrays the pattern of non-task message exchange through 15 social support behaviours. This figure shows the support-score for each category in both Seminar rooms as well as Coffee shops for the three classrooms.

The above figure reveals some interesting findings. First, the figure clearly shows that non-task social interactions happened more in Seminar rooms, rather than the Coffee shop. Perhaps one reason is that students have been more active in Seminar rooms where learning activities occur. Therefore it can be inferred that non-task social interactions evolve more in the context of on-task activities, rather than in plain non-task environments. The second finding is that majority of non-task interactions belong to Reflections. This, in turn, indicates that majority of non-task discussions is about individuals’ thoughts, experiences and expressions. In our study, students talked about variety of topics such as petrol price, their family and kids, workplace situations, and travel experiences. Some randomly selected examples of such discussions follow:

Example 1: I am writing from Shanghai which has a population of anywhere between 14 and 16 million (depending on which estimate one uses)
Example 2: For those QLD residents interested, here is a link to list of where you can buy ethanol blended fuel
Example 3: I am married and have a son who turns ten on Wednesday. I keep asking myself where did the last decade go?
Example 4: More years ago than I care to admit, I entered university with the intention of becoming a physicist or chemist, discovered computer programming in Applied Mathematics and switched to Computer Science.

Our further analysis of Reflections showed that while in Seminar rooms students talk mainly about those experiences that less or more are related to their course topics whereas in the Coffee shop they mainly discuss their personal and family-related issues.

4.2 The trend of non-task interactions

The second finding of the content analysis demonstrates the trend of non-task social exchanges for a period of 10 weeks. Figure 2 shows that the support score in the first week in all three courses has been higher than the other weeks. Our further investigation of the discussions with a comparison between findings in this Figure and Figure 1 has revealed that in weeks 1 and 2 students started with salutations, introducing themselves, and talking about their previous experiences as well as commenting on other classmates’ statements.

Figure 2 also indicates due dates for assignments and the final exam. The findings in this Figure show that when the deadline of an assignment approached, support scores fell slightly. Yet, the support scores went up slightly for the period of the final exam. Analysis of the content of messages has revealed that as the end of the course came closer, students posted acknowledgements, salutations and thanks messages more than other times during the semester. In addition, Figure 2 shows a drop in week 5 which is mainly because of the Christmas holidays. Lastly, while weeks 4 and 6 are mid-term recession time, students actively posted messages during these weeks, particularly in week six when the non-task activities rose sharply as a result of New Year wishes and greetings.
Figure 3 demonstrates the changes of support scores in the coffee shops for each course. Similar to Figure 2, a high number of non-task exchanges occurred during the first week. Yet, unlike Figure 2, Figure 3 shows that after the first few weeks, non-task interactions gradually disappeared. One possible reason could be inferred from Figure 1 where the non-task exchanges in the coffee shops predominantly belonged to the reflections category. This in turn would imply that when students started to know one another and exchanged personal thoughts and work and family experiences in the seminar room, they were less inclined to get involved in the subsequent coffee shop activities. The other reason for the disappearance of non-task interactions after the initial few weeks is that, similar to Figure 1, when deadlines of assignments approached, support scores fell slightly. The same trend happened when the deadline of Assignment 2 approached. Therefore it can be inferred that during the assignment periods students were less interested to participate in non-task activities in the coffee shops.

Similar to Figure 2, non-task social interactions in Figure 3 has been dropped during the Christmas period. Yet, unlike Figure 2, and except for one course, very few non-task messages have been exchanged during the final exam period. Further investigation of messages posted during the exam break reveal that the majority of non-task interactions took place in seminar rooms, rather than coffee shops. One reason for that is because discussions were mostly focused on on-task question and answering in that period of time.

Overall, the relatively high support scores in the first week in Figure 3, demonstrate that the coffee shop have the capability to provide an environment for non-task social communications and interactions in the CSCL environment.
5. Discussion

The findings of this paper are twofold: firstly, this study, in line with some previous studies, has shown that non-task interactions do occur in the CSCL. Secondly, this study has also shown how the trend of such interactions may vary throughout a semester. As Figures 2 and 3 showed, the amount of non-task social messaging at the beginning of interactions was higher than other times during the study. This may imply that individuals were willing to exchange more social and personal information in the beginning of their interaction in order to get to know one another and to get used to the CMC environment. When initial openings occurred, students focused more on on-task activities and then non-task messaging happened throughout learning interactions. Furthermore, the fact that students continuously were exchanging non-task behaviors may indicate that they have developed some social relationships. This finding can be further explained by social information processing (SIP) theory. The SIP theory suggests that participants in online discussions develop individuating impressions of others through accumulated CMC messages and interactions and consequently may develop relationships through textual or verbal cues [18].

The above findings therefore stress the importance of fostering and supporting non-task interactions in future CSCL developments and practices. Muilenburga and Berge have also underlined the importance of social interaction in the CSCL as they found such interaction is strongly associated with the joy of learning online, learning effectiveness, and the likelihood of taking another online class [13].

6. Conclusion

This paper studied the pattern of non-task social messaging over a period of 10-weeks time in a CSCL environment. The paper distinguished non-task interactions from on-task interactions in the environment and findings showed that majority of non-task conversations tapped into the Reflections category, which indicate people shared many life and work experiences in both Seminar rooms and Coffee shops conversations. In addition, the findings of the present study showed that over time, the stream of personal and non-task social information may vary. It may rise or drop in different time periods; therefore the smoothing effect of a longer time span is needed for more accurate analysis of the level of social message exchange.
Overall, by distinguishing between students’ non-task social interactions from on-task interactions, and through content analysis, this paper demonstrates that non-task interactions do occur throughout a semester in CSCL environments. Therefore, the findings of this study further draw the attention of CSCL teachers and developers to the importance of non-task interactions in the future teaching and development practices.

6- References